LAMBERTO CESARI
(1910–1990)

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In Memoriam

Lamberto Cesari (1910–1990)

Lamberto Cesari died in Ann Arbor, Michigan, on March 12, 1990, at the age of 79. His distinguished academic career included major contributions to surface area, calculus of variation, optimal control, ordinary and partial differential equations, and nonlinear analysis. His philosophy, which he instilled in his many students, was that one of the primary roles of mathematics is to assist in the explanation of physical phenomena.

Lamberto Cesari was born on September 23, 1910, in Bologna, Italy. In 1933, he received his degree from the Scuola Normale Superiore in Pisa under the supervision of Professor Leonida Tonelli. The research contributions while at Pisa served as the seeds for his continued interest in the topics of surface area, calculus of variations, and eventually optimal control. His first position was at the Institute for Numerical Analysis of the National Research Council in Rome. During his tenure there, he was exposed to many applied problems dealing with vibration of beams under various types of loadings. This led to his interest in the theory of oscillations in differential equations and the publication of some fundamental papers in this area.

In 1938, he was appointed associate professor at Pisa and Bologna and he became a full professor at Bologna in 1947. In 1949, because of his renowned stature in surface area, Cesari came to the United States with visiting positions at the Institute for Advanced Studies at Princeton, the University of California at Berkeley, and the University of Wisconsin at Madison. In 1950, he accepted a professorship at Purdue University, where he played a major role in the development of a strong research group devoted to surface area, and his book, *Surface Area* (Princeton University Press, 1956), has become a classic. At the same time, he renewed his interest in and trained students in differential equations. Careful readings of the original publications of Poincaré and Lyapunov, together with the originality of Cesari, altered the perspective on differential equations, led to fundamental ideas in stability and nonlinear oscillations which required several years to develop, and contributed to the publication of one of the first modern books on differential equations by Cesari, *Asymptotic Behavior and Stability Problems in Ordinary Differential Equations* (Springer-Verlag, 1959). In 1958–1960, Cesari was one of the first visitors

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at the newly formed Mathematics group at the Research Institute of Advanced Studies (RIAS) directed by S. Lefschetz and J. P. LaSalle.

In 1960, Cesari joined the faculty of the University of Michigan, where he remained until his retirement in 1980. During this period, he continued to make significant contributions to nonlinear analysis and differential equations. In addition, his original results on calculus of variations were extended and modified in order to accommodate the problems of optimal control for ordinary and partial differential equations. His goal for many years had been to write a trilogy on this subject, but, unfortunately, only one volume was completed, *Optimization: Theory and Applications. Problems with Ordinary Differential Equations* (Springer-Verlag, 1983).

After his retirement from the University of Michigan, Cesari spent much of his time as a professor in Perugia, where he formed a very strong group devoted to problems of optimality in multidimensional problems.

Throughout his career, Cesari received many honors in recognition of his contributions to teaching and research. Among these honors are the first R. L. Wilder Professor of Mathematics at the University of Michigan, the degree *laurea honoris causa* from the University of Perugia, and his election to the Italian National Academy (Lincei).

Throughout his career, Cesari had a very special interest in young people, continually encouraging them in their work and making every effort to create an atmosphere in which they could achieve their maximum potential. He had a profound effect upon the careers and attitudes of his own students (more than 40) as well as many other young researchers.

So far, we have mentioned only a few of the scientific aspects of the life of Cesari. There was much more. He was intensely interested in all intellectual and creative endeavors and in the human dimension of our profession. This philosophy and attitude was reinforced by or perhaps much of it originated from his wife, Isotta, who was always by his side. To have the occasion to spend time with the two of them was a special experience which could never be forgotten.

It is indeed a pleasure to be able to dedicate this modest issue of the *Journal of Differential Equations* to Professor Lamberto Cesari. We thank Professor R. Kannan for his assistance in soliciting the papers.

JACK K. HALE